STROMATOPORELLA NICHOLSON, 1886 (FOSSIL ORDER STROMATOPOROIDEA): PROBLEM OF THE TYPE—SPECIMEN OF THE TYPE—SPECIES, *STROMATOPORELLA GRANULATA* (NICHOLSON), 1873, Z.N.(S.)2177

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The International Commission on Zoological Nomenclature is hereby petitioned to exercise its plenary powers to suppress the original syntype specimens of *Stromatoporella granulata* (Nicholson), 1873, from the "Corniferous Limestone (Devonian) of Port Colborne and Savage's Quarry, Wainfleet, on the north shore of Lake Erie, Canada West" (Nicholson, 1873, p. 94, pl. 4, figs. 3, 3a) in favor of a specimen later used by the original author to redescribe and to re-illustrate *Stromatoporella granulata*. Nicholson's later described specimen came from younger strata, the Middle Devonian Hamilton "Formation" (now considered a stratigraphic group) and was collected from Arkona, Ontario, a substantial distance--208 km (130 mi)--from the original type locality (Nicholson, 1886a, pl. 1, figs. 4, 5, 15 [not fig. 14] pl. 7, figs. 5, 6; 1891, p. 202; 1892, p. 203, 204, pl. 26, figs. 1, 1a, 1b). This Arkona specimen is specimen number 329, accompanied by microscope slides 329a-329f, in the H.A. Nicholson Stromatoporoid Collections in the Department of Invertebrate Palaeontology, British Museum (Natural History), London. The Commission is petitioned to designate the above mentioned Arkona specimen as a neotype under its plenary powers, because the specimen does not meet the qualifications of a neotype [Art. 75(c) (5)] — it does not come from the type locality, the type stratigraphic horizon, or the original type collection.

2. H.A. Nicholson, in 1873, described and illustrated a new species, *Stromatopora granulata* from the "Corniferous Limestone" (now called the Onondaga Formation) of Port Colborne and from Savage's Quarry, Wainfleet, Ontario, Canada. The description is brief, it dwells mostly on surface coenostial characters and gives a general description of the gross coenostial reticulation formed by laminae and pillars. The figures consist of a crude illustration of a fragment of a coenosteum at natural size and a slightly enlarged lateral view of a fragment which only poorly illustrates the reticulum of the coenosteum. No mention is made of ring-pillars or skeletal tissue structure (which are diagnostic generic characters of the genus *Stromatoporella*) nor are ring-pillars or tissue illustrated. The original description and illustrations are inadequate to determine either the generic or the specific stromatoporoid characteristics in terms of present-day concepts. Nicholson did not indicate whether the figured specimens came from Port Colborne or Wainfleet, but the two localities are only about

10.4 km (6.5 miles) apart. The whole area is underlain by bedrock of Onondaga age. Some stratigraphers currently place the Onondaga Formation at the top of the Lower Devonian, others place it at the base of the Middle Devonian.

3. In 1874, Nicholson (p. 10, 11) described a fragment of a new specimen he assigned to *Stromatopora granulata* from the Hamilton Group in Bosanquet Township, Ontario, Canada, which is located in Lambton County, on Lake Huron, and includes the towns of Thedford and Arkona. As the Hamilton Group (middle Middle Devonian) is younger than the Onondaga Formation from which the original material came, the new specimen extended the stratigraphic range of the species from basal Middle to middle Middle Devonian. Nicholson augmented the original description by noting "oscula" and pores. These could be axial tubes of mamelons and the hollow centers of ring-pillars, but the description is too inadequate to be certain and no figures were included.

4. Nicholson and Murie, 1878 (pl. 1, figs. 12, 13) published the first figures of thin-sections of *Stromatopora granulata*. The figures illustrated ring-pillars for the first time. Nicholson subsequently considered ring-pillars to be one of the diagnostic characteristics of the genus *Stromatoporella*. Nicholson and Murie also illustrated a portion of the surface of a specimen with a single astrorhiza (*op. cit.*, pl. 1, fig. 11). This figured specimen of *Stromatopora granulata* by Nicholson and Murie is not from type material, but comes from the Hamilton Group of Ontario, Canada, with no precise locality given. No description was included in the article, therefore the presence of ring-pillars is determinable only by examination of the illustrations.

5. In 1886, Nicholson (1886a, p. 92-95) named the new genus *Stromatoporella* and designated *S. granulata* (Nicholson), 1873 as the type species (*op. cit.*, p. 94). He mentioned that *S. granulata* is "...abundant in the Hamilton and Corniferous formations of Western Canada". Nicholson considered ring-pillars, which he called zoöidal tubes, "peculiar" to the genus and noted (p. 93) that zoöidal tubes were characterized in tangential section by "complete or incomplete rings". The fact that ring-pillars are present is also indicated in the supporting illustrations of a specimen from the Hamilton Group of Ontario (*op. cit.*, pl. 1, figs. 4, 15, pl. 7, figs. 5, 6).

6. In another work published the same year (1886b, p. 10, 11) Nicholson redescribed *S. granulata* and noted "...close-set tubercles of various sizes, the smaller of these being imperforate, while the larger ones are perforated at their apices by distinct circular apertures". Nicholson noted pillars, often in the form of a ring, which he interpreted as the perforate tubercles he described on the coenostial surface. He did not illustrate any specimens in this work, but he noted again the occurrence of the species from the Hamilton beds at Arkona, Ontario and the "Corniferous" limestone of Port Colborne. Only gallery height was given, so that the diagnostic species-characteristics are insufficient to establish the nature of

S. granulata, but it is clear from his description that what Nicholson then considered to be *S. granulata* from the type area and horizon must have had ring-pillars, and a skeleton composed of minute pores and an incomplete reticulum.

7. Attention must be drawn to Nicholson's diagnostic generic emphasis on the ring-like structure because several modern authors have overlooked this important generic structure noted in Nicholson's original generic and subsequent descriptions and illustrations of *Stromatoporella*. Most authors in the past have considered *Stromatoporella* to possess ring-pillars (i.e. Parks, 1936, p. 39; Yavorsky, 1943, p. 369; 1950, p. 243; 1962, p. 163; Galloway, 1957, p. 436; Stearn, 1966, p. 93; Kaźmierczak, 1971, p. 86; 1971, p. 51; Zukalová, 1971, p. 51; etc.). However, a few authors have disregarded ring-pillars as a generic character and have included some species in *Stromatoporella* which would be better placed in other genera (i.e. Lecompte, 1951, p. 152; 1956, p. F131; Sleumer, 1968; 1969, p. 37-42). We must rely, however, on the intention of the original generic description. Part of the confusion concerning the generic character of *Stromatoporella* is based on the morphological interpretations of specimens which do not belong to the type-species.

(a) For example, in 1936, Parks (p. 94, 98, 99) interpreted ring-pillars in *Stromatoporella* as inflected laminae in vertical section and as large pores in tangential section. However, Parks complicated the issue (p. 77) by naming a new genus, *Stictostroma* based on "cogenotypes". One genotype, *Stromatopora mammillata* Nicholson, 1873 proved to be a homonym of *Stromatopora mammilata* Schmidt, 1858. *Stictostroma mammillatum* of Parks has a microtissue like *Stromatoporella*, but lacks ring-pillars. Parks's second "cogenotype" was a new species, *Stictostroma eriense*, with extremely well developed ring-pillars (*op. cit.*, p. 81-83, pl. 5, figs. 1-4). Later, Galloway and St. Jean (1957, p. 124) renamed Nicholson's species *Stictostroma mammilliferum*, and selected it as the type species of *Stictostroma* placing *S. eriense* Parks in the genus *Stromatoporella*.

(b) Lecompte (1951, p. 152-158) wrote a detailed historical account of *Stromatoporella* in which he concluded that ring-pillars were not of generic importance. As a consequence, he placed *Stictostroma* in synonymy with *Stromatoporella*, thereby including many forms without ring-pillars in *Stromatoporella*. His interpretation was in part based on Parks's inclusion of ring-pillar-bearing and non-ring-pillar-bearing species in *Stictostroma* as well as on Parks's interpretation of ring-pillars as inflected laminae.

(c) Finally, Sleumer (1968; 1969, p. 37-42, pls. 24-27) following Lecompte, placed specimens clearly belonging to three or four other genera in the species *Stromatoporella granulata*. In his re-evaluation of *S. granulata* Sleumer paid little attention to the type description of either the genus *Stromatoporella* or the species *S. granulata* in his interpretations.

8. The real problem concerning the nature of the type-specimen, and therefore the nature of the type-species of the genus, is that later Nicholson

(1891-1892, p. 202-204) re-evaluated his species *Stromatoporella granulata*. He selected and illustrated a specimen of Hamilton age from Arkona, Ontario (British Museum (Natural History), Nicholson Collection, specimen number 329) to represent the species. He then implied that *S. granulata* was restricted to the Hamilton Group, even though the original type-material came from older beds of Onondaga age in the Port Colborne area, about 208km (130 mi) from Arkona. He called the specimens of *Stromatoporella* from the Port Colborne area (i. e. from the original type locality and horizon of *S. granulata*) a new species, *Stromatoporella selwynii* (1892, p. 205, 206, British Museum (Natural History), Nicholson Collection, Specimen Numbers 330 and 331) whose distribution is "not uncommon in the Corniferous Limestone of Port Colborne, Ontario". His restriction of *Stromatoporella granulata* to the Hamilton beds thus deprived the type specimens (from the Onondaga Formation) of their original taxonomic designation. Such an arbitrary nomenclatural exclusion of the type-specimens is contrary to the present-day International Code of Zoological Nomenclature.

9. The location of the original type-material of *Stromatoporella granulata* is not now known. During the time from the first publication of *S. granulata* until his death, Nicholson was associated with the University of Toronto in Ontario, Canada and St. Andrews and Aberdeen Universities in Scotland. A large portion of Nicholson's collections was placed in the British Museum (Natural History) in London. Dr. John Monteith of the Royal Ontario Museum in Toronto, Dr. N.H. Trewin of the Department of Geology and Mineralogy, University of Aberdeen Marischal College, and Dr. A.R. MacGregor of the University of St. Andrews in Scotland have all searched their collections for the original type specimen of *Stromatoporella granulata* (Nicholson), without success. A possibility exists that the type specimen of *S. granulata* was later used by Nicholson for the type specimen of *S. selwynii*, because they both came from the same geographic area and the same stratigraphic horizon. I have examined the slides of both *S. granulata* (Nicholson), as redesignated in 1891-1892, and *S. selwynii* Nicholson, in the collections of the British Museum (Natural History) as well as Nicholson's notebook, written in his own hand. The slides, the accompanying labels, and Nicholson's notebook contain no indication that the type-specimen of *S. selwynii* was the original type-specimen of *S. granulata*. Further, Mr. Richard F. Wise, of the British Museum (Natural History), made a recent search of Nicholson's unsectioned specimens and could not find the type-specimen. He found no evidence that *S. selwynii* is one and the same specimen as the type of *S. granulata*. Also, in comparing the type figure of *S. granulata* (Nicholson, 1873, pl. 4, fig. 3) with the specimens in the Museum's collections, Mr. Wise could not find any specimen to match the original figure. In view of the above, we can consider the original type-material of *S. granulata* (Nicholson) lost.

10. In my own collections from the Port Colborne area, the majority of specimens belong to different species of *Stromatoporella* and *Stictostroma*, but most of them do not agree specifically with Nicholson's identifications from the Hamilton group at Arkona. I found only one specimen of *S. granulata* from the type-horizon and locality at Port Colborne (St. Jean, 1960, p. 276, text-fig. 2). The problem is that, even though some of the newly collected material may indeed be conspecific with the original type specimens of *S. granulata* from the Onondaga Formation at Port Colborne, there is no way of actually knowing because Nicholson never described or illustrated in sufficient detail a specimen from the type-horizon and locality which he himself assigned to *S. granulata*. In addition, no subsequent author who may have seen the original type-specimens has described *S. granulata* from the type area and horizon.

11. Obviously in naming the new genus *Stromatoporella* with the subsequently restricted and redesignated *S. granulata* as the type, Nicholson had in mind the Arkona specimens rather than the type-specimens from Port Colborne, for the Arkona specimens were used to illustrate the genus (1886, pl. 1, figs. 4, 5, 15, pl. 7, figs. 5, 6) with the exception of the coenosteum of one Port Colborne specimen (*op. cit.*, pl. 1, fig. 14) which Nicholson later assigned to *S. selwynii* (1891, p. 202). By 1891 and 1892, five or six years after the publication of *Stromatoporella*, he thought of *S. granulata* as being restricted to the Hamilton Formation (i.e., 1892, p. 203) "Having now fully examined my available material, I have come to the conclusion that the Devonian rocks of North America contain two allied but nevertheless really distinct species of *Stromatoporella*, which up till now I have included under the single name of *S. granulata*. One of these — the true *S. granulata* — occurs in the Hamilton formation, and I have supplemented the figures of its microscopic structures with a drawing of an actual specimen (Plate XXVI, fig. 1). The other form in question occurs in the Corniferous Limestone of Canada; and I shall briefly describe it under the name of *S. Selwynii*, Nich.".

12. With regard to the problem of the type-specimen of the type-species of *Stromatoporella*, three courses of action are possble.

(a) The simplest action would be to select a specimen from the type area and stratigraphic horizon, and designate it a neotype. In view of the fact that a wide variety of interpretations have been placed on *Stromatoporella* recently (see 7 above) and in view of the fact that several species of both *Stictostroma* and *Stromatoporella*, as well as other genera occur in the area, a neotype would reflect the subjective interpretations of the collector rather than Nicholson's original intent.

(b) One could take some of the unsectioned specimens in the Nicholson collection at the British Museum (Natural History), have sections prepared, and designate one of them as the type. However, due to the fact that the internal characters of these specimens have never been known, not even to Nicholson, the same prejudicial judgements would come into play.

(c) The best alternative is to have the Commission suppress the original type-specimens of *Stromatoporella granulata* and recognize the specimen no. 329 (slides 329 a-f) in the British Museum (Natural History) as the neotype. This specimen was used by Nicholson to describe *Stromatoporella* for the first time and it reflects the author's original intent with respect to at least generic-level considerations.

13. The request to suppress the type-specimens even though they are lost is due to the fact that morphological details of specimen number 329 are well known. The important characteristics of the type-specimens have never been known, except perhaps to Nicholson, and perhaps not even very well known to him. If for some unexpected reason the type-specimens are located, a knowledge of their detailed generic and specific characters would be apt to upset a nomenclatural stability which has existed at least from Nicholson's re-evaluation of the species in 1891 and 1892.

14. In making the decision the Commission should keep in mind the following factors:

(a) In 1873 Nicholson named a new species *Stromatopora granulata* from Onondaga deposits near Port Colborne, Ontario.

(b) In 1874, Nicholson described *Stromatopora granulata* from the younger Hamilton beds near Arkona, Ontario.

(c) In 1886, Nicholson named the new genus *Stromatoporella* and designated *Stromatoporella granulata* as type-species.

(d) In 1891, Nicholson split off a new species, *Stromatoporella selwynii* (Onondaga, Port Colborne, lower Middle Devonian) and retained the name *Stromatoporella granulata* for the Arkona specimens, restricting *Stromatopora granulata* to Hamilton age deposits (middle Middle Devonian).

(e) The original type specimens from Onondaga were eventually lost. Their descriptions and illustrations are inadequate for generic and specific identifications. Recent collections have been made from the type-area and horizon (Onondaga) but it is impossible to determine if any are conspecific with the original *Stromatopora granulata*.

(f) The existing confusion in morphological interpretations reflects the need and urgency to designate a new type specimen of *Stromatopora granulata* about whose legitimacy there can be no doubt. The validation of the proposed neotype number 329, in the Nicholson collection in the British Museum (Natural History) should clear up some of the confusion about the genus *Stromatoporella* and its type species *Stromatopora granulata*.

(g) The proposed neotype specimen reflects the author's original intent better than any other specimen available.

(h) The proposed neotype specimen has been for nearly a century in a famous repository, under exceptionally competent curatorial care, and is accessible to the majority of world scientists who may be interested in the genus and species in question.

15. The Commission is therefore asked:
    (1) to use its plenary powers to suppress all designations of type-specimen for the nominal species *Stromatopora granulata* Nicholson, 1873 hitherto made and to designate specimen No. 329 in the British Museum (Natural History), London, with the slides 329a-329f prepared from it as neotype of that species;
    (2) to place the generic name *Stromatoporella* Nicholson, 1886 (gender: feminine), type-species, by original designation, *Stromatopora granulata* Nicholson, 1873 (as defined by the neotype designated under the plenary powers in (1) above) on the Official List of Generic Names in Zoology;
    (3) to place the specific name *granulata* Nicholson, 1873, as published in the binomen *Stromatopora granulata*, and as defined by the neotype designated under the plenary powers in (1) above (specific name of type-species of *Stromatoporella* Nicholson, 1886) on the Official List of Specific Names in Zoology.

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